

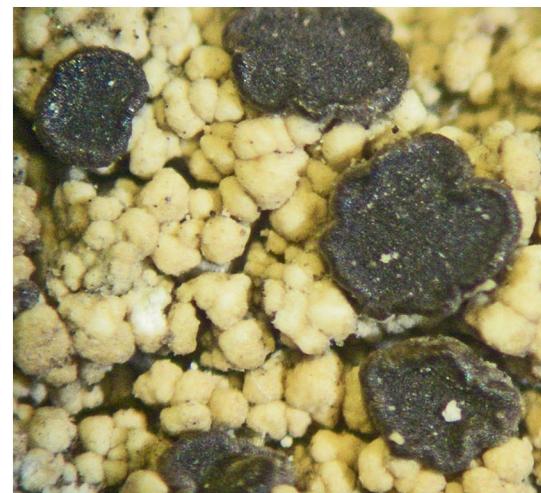
GLALIA

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**Pieter van den Boom,
Klaus Kalb & John Elix**

*Fuscidea tropica,
a new lichen species*



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***Fuscidea tropica*, a new lichen species from Brazil, Guatemala and Venezuela**

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Abstract — Van den Boom, P. P. G., Kalb, K. & Elix, J. A. (2014) *Fuscidea tropica*, a new lichen species from Brazil, Guatemala and Venezuela. *Glalia* 6(4): 1–7. — The new species *Fuscidea tropica* van den Boom & Kalb from higher mountain ranges (c. 1000 m and 3150 m) in the Neotropics. It is characterized chiefly by its corticolous habitat, medially constricted ascospores and the presence of sekikaic acid. In addition, the new combination *Malmidea fulva* (Malme) Kalb & van den Boom is made.

Key words — Neotropics, *Malmidea*, species nova, new combination, ecology, taxonomy, chemistry

Introduction

In 2004, a field trip was undertaken by the first author to Guatemala (Central America) with the aim of collecting lichens and lichenicolous fungi at higher altitudes. On the highest volcano of Guatemala, Tajumulco, specimens of a corticolous *Fuscidea* were collected in a field at 3150 m, as well as in a forest area not far from there at 2700 m. The same species was also located amongst the large amount of lichen material, collected by the second author from Brazil, Guatemala and Venezuela as part of a long-term study of lichens in the Neotropics.

There are relatively few corticolous representatives of the genus *Fuscidea*. KANTVILAS (2001) reported *Fuscidea australis* Kantvilas s. str., *F. australis* var. *montana* Kantvilas and *F. lightfootii* (Sm.) Coppins & P. James from Tasmania and *F. elixii* Kantvilas as well as *F. australis* Kantvilas s. str. from mainland Australia (KANTVILAS 2004). For Norway, TØNSBERG (1992), treats four corticolous species, *F. arboricola* Coppins & Tønsberg, *F. pusilla* Tønsberg, *F. praeruptorum* (Du Rietz & Magnusson) V. Wirth & Vězda and *F. recensa* (Stirton) Hertel, V. Wirth & Vězda, all of which are sorediate. For the British Isles, GILBERT et al. (2009) recorded two sorediate, corticolous species (*F. arboricola* and *F. lightfootii*) as well as *F. cyathoides* (Ach.) V. Wirth & Vězda, a species which is usually saxicolous. For North America, FRYDAY (2004) treats only two corticolous species, *F. arboricola* and *F. pusilla*, as well as *F. praerup-*

torum, *F. recensa* var. *recensa* and *F. recensa* var. *arcuatula*, species which are occasionally corticolous or lignicolous but usually saxicolous. None of these species have the same thallus structure or chemistry as the specimens collected in the Neotropics. VAINIO (1890) has been checked to be sure that none of the species he treats, especially in the genus *Lecidea*, could refer to the new *Fuscidea* species.

The genus *Fuscidea* has very rarely been recorded for Central America. Only *F. recensa* is known from Costa Rica (UMAÑA TENORIO et al. 2002). Although several checklists of Central American lichens are rather incomplete, the checklists for Costa Rica and El Salvador (SIPMAN 2001) are quite advanced. Thus it appears that the genus *Fuscidea* is rarely represented in this part of the world, with one known species (*F. recensa*) and the additional new species, *F. tropica*.

Material and methods

The study is based on herbarium material collected by the authors. Ecological data mentioned below are based on observations of the new species in its natural habitats. Data for other species are derived from the literature. Chemical constituents were identified by TLC (K. Kalb) and/or HPLC (J.A. Elix). The collections were examined by light microscopy. Sections of thallus, apothecia and pycnidia were mounted in water. The specimens are kept in the herbaria of the collectors (hb. van den Boom, hb. Kalb), but the holotype is kept in B.

Results

***Fuscidea tropica* van den Boom & Kalb, sp. nov.**

MycoBank No.: MB807065

Species recognized by the following characters: thallus warty areolate to subsquamulose, up to 2.5 cm wide, pale grey to pale brownish grey; prothallus pale brown to rarely dark brown; apothecia dark brown to blackish, up to 1.4 mm wide; ascospores with obtuse ends, medially constricted, not septate, 8.5–11(–12) × 4–5 µm; conidia dacyroid, 2–2.5 × 1–1.2 µm; containing seikaic acid.

Type — GUATEMALA. QUEZALTENANGO: NW of Quezaltenango, NNW of San Marcos, along trail from San Sebastian to the top of volcano Tajumulco, on ENE slope, above the small village El Rodeo, shrubs and outcrops in open field, 15° 02.9' N, 91° 51.3' W, 3150 m, on *Baccharis vaccinoides*, 25 July 2004, P. & B. van den Boom 33039 (B, holotype; hb. v.d. Boom, isotype).

(Fig. 1, 2)

Thallus forming patches 1–2.5 cm wide, unevenly rimose-areolate, warty, up to 0.2 mm thick; warts mostly crowded, sometimes overgrowing one another and appearing subsquamulose, 0.1–0.3 mm wide; upper surface whitish, pale grey to pale brownish grey, matt to weakly shiny. Prothallus inconspicuous or pale to rarely dark brown, especially when growing adjacent to other lichens; thallus in section not cellular, without differentiated layers, I–. Photobiont *Chlorella* type, with cells scattered throughout the thallus, 5–15 µm diam.

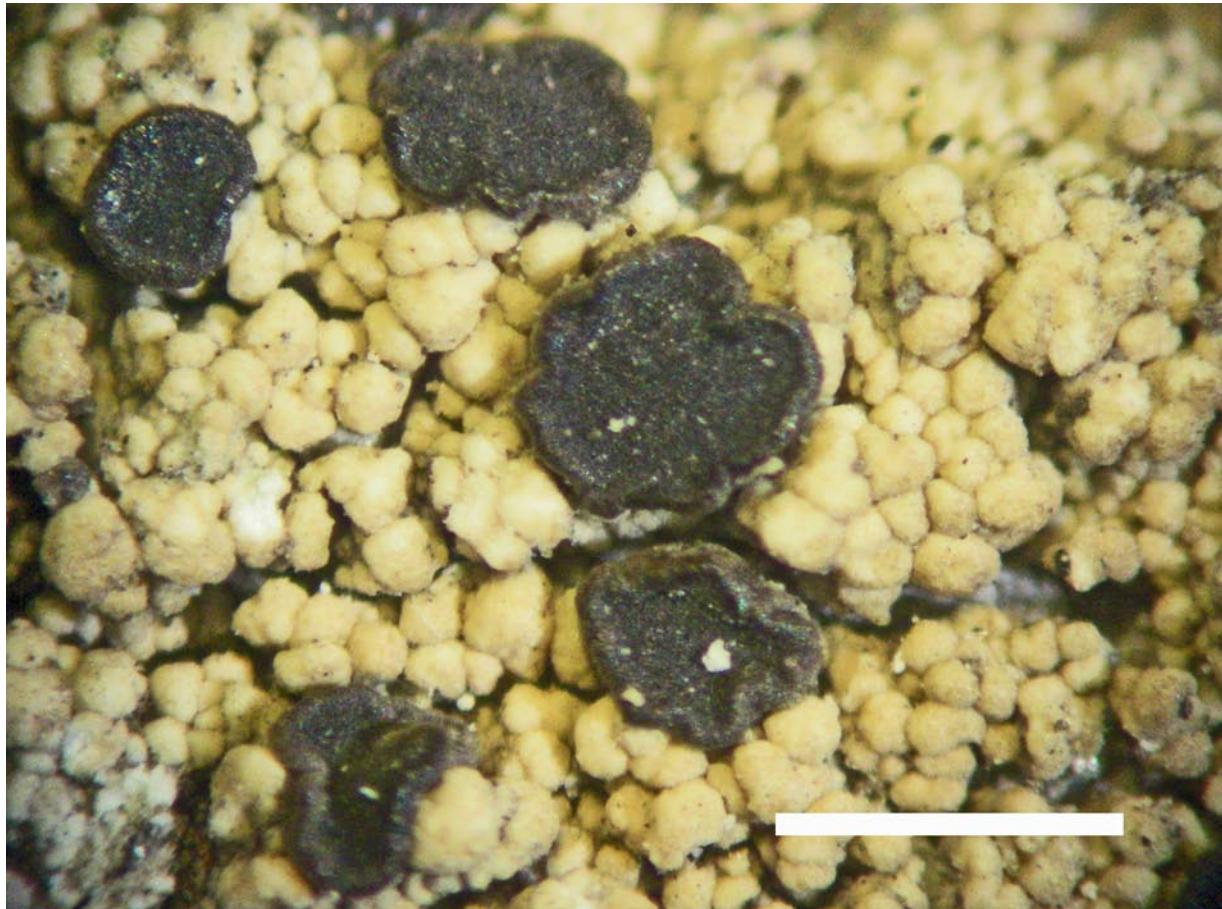


Figure 1 — *Fuscidea tropica* (v.d. Boom 32868), habitus. Scale = 1 mm. Photograph by P.P.G. van den Boom.

Apothecia scattered or sometimes clustered, appressed to sessile, often constricted at base, up to 1.4 mm diam., roundish; margin irregular or flexuose, somewhat paler than the disc; disc plane to slightly convex, dark brown to blackish; proper excipulum hyaline within, yellowish to pale brown towards the outer rim, hyphae strongly branched and conglutinated, c. 70 μm thick laterally, c. 100 μm thick at the base. Hymenium hyaline to pale brownish, with fine black granules, up to 170 μm thick. Epithecium medium to dark brown. Hypothecium up to 80 μm high, \pm prosoplectenchymatous, cells hyaline. Paraphyses simple to rarely branched or forked, septate, mid-hymenium cells (1.5–)2–2.5 μm wide, c. 8–11 μm long, a brown pigment surrounding the 1–2 uppermost cells; apices sometimes slightly broadened up to 4 μm wide. Ascus *Teloschistes*-type, narrowly clavate when young, becoming broadly clavate, 30–40 \times (6–)8–12 μm , 8-spored. Ascospores straight, oblong, with obtuse ends, medially constricted, not septate, 8.5–11(–12) \times 4–5 μm .

Pycnidia occasionally present, 50–120 μm diam., medium to dark brown in the upper part, laterally pale brown, hyaline below, ostiole sometimes gaping; conidiogenous cells elongate, unbranched or branched at base, up to 8 μm long and 1.5 μm wide. Conidia oblong-ovoid to tear-drop-shaped (dacyroid), c. 2–2.5 \times 1–1.2 μm .

Chemistry. Sekikaic acid (major) by TLC and HPLC.

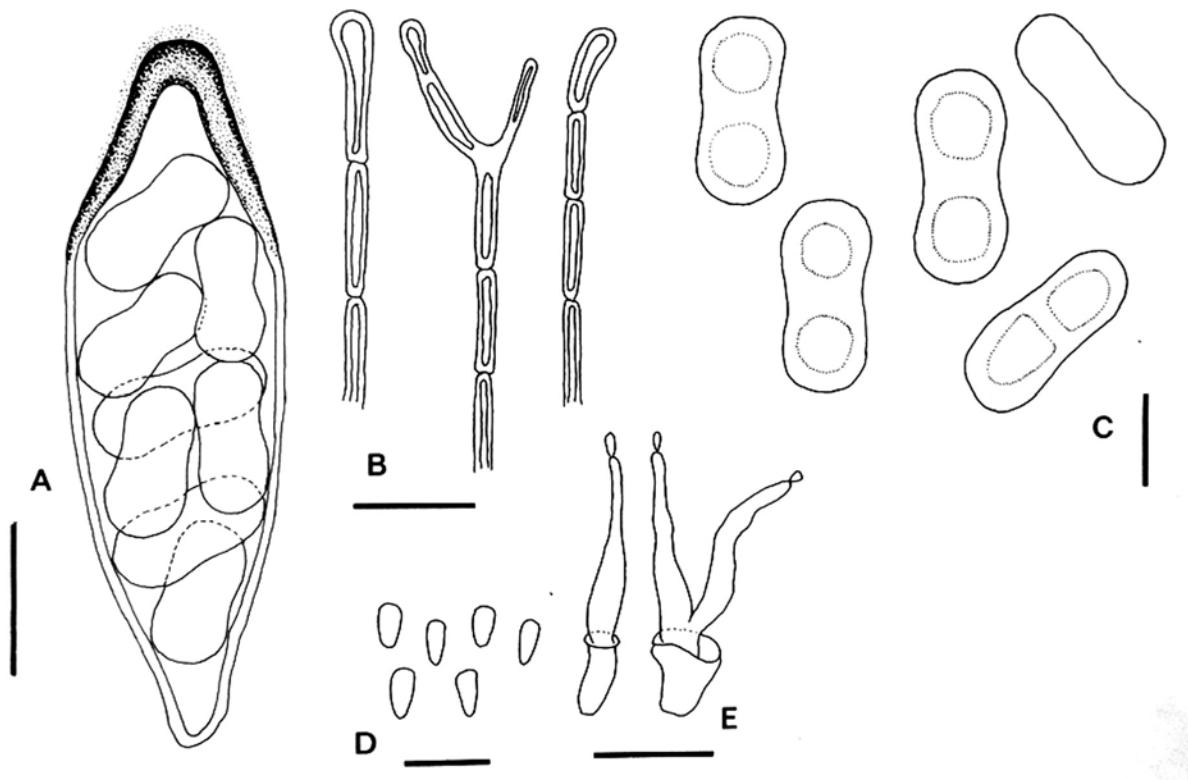


Figure 2 — *Fuscidea tropica* (taken from holotype). A, ascus; B, paraphyses; C, ascospores; D, conidia; E, conidiogenous cells. Scales: A & B = 10 µm; C-E = 5 µm.

Ecology and distribution: *Fuscidea tropica* has been found at altitudes of 2700–3150 m in western Guatemala and c. 1000–2750 m in Brazil and Venezuela. It is a corticolous species occurring on somewhat acidic bark (e.g. *Alnus* and *Baccharis*). At the type locality on the NE slope of the volcano, Tajumulco, it occurs in open places and in mixed forests nearby (Laguna Chicabal). At the type locality, *Fuscidea tropica* is very common and well developed and occurs in an area poor in lichen species. The only accompanying species is *Scoliciosporum gallurae* Vězda & Poelt and some fragments of an unidentified, sorediate crust. A few additional terricolous or saxicolous lichens were encountered in that area. At the nearby locality (specimen 32868), *Fuscidea tropica* was less well developed but occurred within a more species-rich association including *Flavoparmelia caperata* (L.) Hale, *Heterodermia magellanica* (Zahlbr.) Swinscow & Krog, *Hypotrachyna rockii* (Zahlbr.) Hale, *Japewiella tavaresiana* (H. Magn.) Printzen, *Parmotrema sorediiferum* Hale, *Physcia alba* (Fée) Müll. Arg., *Physcia poncinsii* Hue, *Punctelia perreticulata* (Räsänen) G. Wilh. & Ladd, *P. subrugulosa* (Nyl.) Krog, *Scoliciosporum umbrinum* (Ach.) Arnold. All these species grew on the same phorophyte as *F. tropica* (*Alnus arguta*).

Remarks: *Fuscidea tropica* most closely resembles *F. lightfootii*, but that species is usually sorediate, its thallus has a greenish tinge and contains divaricatic acid and the conidia are bacilliform (1.5-)2-3 x 1 µm (OBERHOLLENZER & WIRTH 1984).

The new species also resembles *Fuscidea cyathoides* which may be corticolous and can have weakly developed verrucose areoles of similar dimensions to the thalline granules present in *F. tropica*. However, the thallus of the new species is often whitish or very pale brown in contrast to the much darker grey to deeper brown colour of *F. cyathoides*. Whilst the apothecia of the two species are rather similar in appearance and size, the ascospores of *F. cyathoides* are somewhat larger and bean-shaped whereas the conidia are bacilliform and 2-3 x 1 µm. Furthermore, the chemistry of the two species differ; *F. cyathoides* containing the β -orcinol depsidone, fumarprotocetraric acid. The *meta*-depside, sekikaic acid, is not uncommon in *Fuscidea*. It is also known from *Fuscidea hottentotta* Brusse (BRUSSE 1989) and *Fuscidea maccarthyi* Kantvilas, a species which occurs on sandstone in coastal areas in Australia (KANTVILAS 2004).

Additional specimen examined (*Fuscidea tropica*) — GUATEMALA. **TOTONICAPAN**: near San Cristobal, open oak-conifer forest, 2450 m, 12 January 1979, K. Kalb 12097 & G. Plöbst (hb. Kalb). **SOLOLÁ**: between Nahualá and San Cristobal, along Pan American Highway, in open oak forest, 2500 m, 12 January 1979, K. Kalb 12097 & G. Plöbst (hb. Kalb). **QUEZALTENANGO**: San Martin, SE of village, along path to Laguna Chicabal, mixed forest on NW slope, scattered outcrops along path and at open places, 2700 m, 22 July 2004, on *Alnus arguta*, P. & B. van den Boom 32868 (hb. v.d. Boom). VENEZUELA. **MÉRIDA**: Rivas Davila, Paramo la Negra, c. 20 km W of Bailadores, 2750 m, 12 August 1989, K. & A. Kalb 29186 (hb. Kalb). **TACHIRA**: Jauregui, between Bailadores and Pregonero, 2750 m, near El Hato, 13 August 1989, K. & A. Kalb 26948 (hb. Kalb). BRAZIL. **MINAS GERAIS**: Serra do Espinhaço, Serra do Caraça, E of the monastery Caraça, in an open cerrado, 1380 m, 20°10' S, 43°30' W, 8 July 1978, K. Kalb & G. Plöbst = [K. Kalb: Lich. Neotropici #369]. **RIO DE JANEIRO**: Serra da Mantiqueira, between Engeneiro Passos and Registro do Picú, c. 1000 m, 15 March 1980, K. Kalb 33844, 33845 (hb. Kalb). **SÃO PAULO**: Serra da Mantiqueira, near Campos do Jordão, 45 km N of Taubaté, 14 October 1978, K. Kalb 12099 & G. Plöbst (hb. Kalb); ibid., 150 km NE of São Paulo in tropical rain forest, 1700 m, 25 May 1978, K. Kalb 33843 & G. Plöbst (hb. Kalb) = [K. Kalb: Lich. Neotropici #370].

Comparative specimens examined (*Fuscidea cyathoides*) — BELGIUM. **LUXEMBOURG**: Ardennen, Baraque de Fraiture nearby Chabrehez, open place in conifer forest, on trunk of *Fagus*, 600 m, 27 April 1984, P. van den Boom 1169 (hb. v.d. Boom). **LIÈGE**: West-Hertogenwald, 5 km S of Eupen, forest with *Fagus* and *Quercus* trees along stream 'Soor', on trunk of *Fagus*, 410 m, 21 April 1992, P. van den Boom 12252 (hb. v.d. Boom).

Malmidea fulva (Malme) Kalb & van den Boom, comb. nov.

MycoBank MB807066

Lecidea fulva Malme, Ark. Bot. 28A(7): 29 (1936). — Type: Brazil, São Paulo, Santos, in silva minus densa, 6 October 1894, G.A. Malme s.n. (left specimen—lectotype, here designated; S!).

(Fig. 3, 4)

Previously, one of us (KK) considered his collections of *F. tropica* to be conspecific with *Lecidea fulva* Malme and distributed two numbers (369, 370) in his exsiccate, where the new combination, *Fuscidea fulva* (Malme) Kalb, was made (KALB 1986). However, subsequent examination of the type specimen of *L. fulva* revealed it to be a species of *Malmidea*, making a new combination in *Malmidea* necessary.



Figure 3 — Type of *Lecidea fulva* Malme (left specimen: Lectotype of *Malmidea fulva*). Photograph by K. Kalb.



Figure 4 — *Malmidea fulva*; lectotype. Scale = 1 mm. Photograph by K. Kalb.

Remarks: The type consists of three pieces of bark glued to a card (Fig. 3). *Malmidea fulva* is growing on all of them. The largest thallus on the left-hand piece of bark agrees best with the protologue. Therefore we have chosen this fragment for the lectotype (Fig. 4). The specimen on the central fragment is also very typical and well developed, but is small. Two thalli are growing on the right-hand piece of bark, the lower one is quite typical of *M. fulva*, but

the apothecia on the upper thallus are very dark brown, almost black, probably due to environmental reasons.

The description of the species provided by MALME (1936) is comprehensive and will not be repeated here. *Malmeidea fulva* belongs to the *piperis*-group, where the exciple lacks a medullary layer, the asci are 4–8 spored, and the ascospores, 7–11 × 4–6 µm, with a very thin perispore (less than 1 µm).

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We are grateful to Dr. Brian Coppins for reading a preliminary version of the text and for his helpful comments, to two anonymous reviewers and Eimy Rivas-Plata for revision of the text. Special thanks go to Bern van den Boom for assisting in the fieldwork and to Prof. Roselvira Barillas for supporting the first author and his wife during their stay in Guatemala.

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***Graphis* Adans.**

ADANSON, *Familles des Plantes* 2: 11 (1763). – Tipo: *Graphis scripta* (L.) Ach.

Sinónimos:

Opegrapha Humb., *Flora Fribergensis Specimen Plantarum Quasdam Cryptogamicas Praesertim Subterraneas Exhibitum*: 57 (1793); nom. illeg. – Tipo: *Opegrapha vulgaris* Humb.; nom. illeg. = *Graphis scripta* (L.) Ach.

Scaphis Eschw., *Systema Lichenum*: 14 (1824). – Tipo: *Scaphis anfractuosa* Eschw. ≡ *Graphis anfractuosa* (Eschw.) Eschw.

(Fig. 2A–F, 5J–L)

Descripción — Talo grisáceo a marrón amarillento pálido ...

Discusión — Especies de *Acanthothecis* se reconocen ...

Distribución y Ecología — *Acanthothecis* es un género ...

Citación de especímenes:

Especímenes examinados — COSTA RICA. PUNTARENAS: Parque Nacional Corcovado, 83° 15' O, 10° 12' N, 100 m, Estación Sirena, sobre corteza de *Bombacaceae*, Mayo 2005, Chaves 3113 (INB). — COLOMBIA. ...

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Claves taxonómicas:

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15a	Ascosporas pequeñas, menos de 20 µm de largo	16
15b	Ascosporas medianas a grandes, más de 20 µm de largo	18

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Tablas:

Tabla 1 — Separación tradicional de géneros en la familia *Graphidaceae* (según MÜLLER ARGOVIENSIS 1880, 1882, 1887a, b, 1894a; ZAHLBRUCKNER 1907, 1923, 1926).

Organización apotecios	Ascosporas hialinas transversal	Ascosporas hialinas muriformes	Ascosporas marrón grisáceas transversal	Ascosporas marrón grisáceas muriformes
Lirelas solitarias	<i>Graphis</i>	<i>Graphina</i>	<i>Phaeographis</i>	<i>Phaeographina</i>
Lirelas estromáticas	<i>Glyphis</i>	<i>Medusulina</i>	<i>Sarcographa</i>	<i>Sarcographina</i>

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